Baltimore Harbor TMDL Stakeholder Advisory Group (SAG)
September 10, 2002 Meeting Minutes

Offices of Piper Rudnick
Baltimore, Maryland

Welcome, Introductions and Announcements:

Fran Flanigan reviewed the agenda and set the stage for the third Baltimore Harbor Total Maximum Daily Load (TMDL) Stakeholder Advisory Group (SAG) meeting. Everyone went around table to introduce him or herself. The meeting was delayed approximately 20 minutes due to a traffic detour in the surrounding neighborhood.

Topics raised during open discussion:

No edits recommended to the minutes generated from the May 7, 2002 meeting

Several people indicated that the June meeting to discuss the watershed models was helpful and informative.
Cece Donovan – indicated her concern that the stormwater data collected by the localities and used by MDE for the watershed model was not 'first flush' data (the time period at the beginning of a rain event when most pollutants run off in stormwater). However, she does understand that MDE is working with the data that is currently available.

Note: If people have a need between the quarterly meetings to discuss specific topics presented in these meetings at a higher level of detail than presented; the agency is willing to do so.

Presentations

Update on Baltimore Harbor Modeling Effort (Miao-Li Chang)

- Toxics modeling effort
- Nutrients modeling effort
- Model scenario development procedure

Questions based on presentation:

Q: John Botts – On the MDE website the initial schedule suggested the agency would try to link biology class with the TMDL effort. Is this still planned and does it include the food chain model?

A: Miao-Li Chang – The majority of the modeling deals with metals and this process does not deal with a food web model. However, with PCB's a food web model is needed and we are currently in the process of developing the model to handle that part of the process. Therefore, when the process is further along we will attempt to integrate the biology and chemistry of the processes and how they impact the water quality of the Harbor.

Q: Bill Stack – How is MDE going to rectify the differences between the MDE watershed model and Chesapeake Bay Program (CBP) watershed model results? How do you see these efforts coming together and dealing with tributary strategies?

A: Rich Eskin – MDE and CBP are moving to merge the efforts such that each organization will use the same models and data to produce the same results. However, in circumstances where TMDLs require MDE to implement finer land use scales and subsequently different data, MDE will use the more refined/finer scale model.

Miao-Li Chang – MDE and CBP have agreed, for future modeling work, to use the same watershed model in MD watersheds that require TMDLs and are within the CBP modeling framework. However, MDE has confidence in the results produced by the finer resolution of its watershed model in the Harbor and will be using those results for the TMDLs.

Rich Eskin – Additionally, MDE has presented the model results to Louis Linker of the CBP and he was impressed with the work and agrees with the MDE approach.

Q: Bill Stack – Has MDE compared the results of the two models?

A: Miao-Li Chang – We have compared our results with the results of HSPF Version 4.3 produced by CBP. Although there are differences in the results, and both organizations recognize this, MDE will move forward with its version of the HSPF watershed model.

Rich Eskin – Recently it has been determined that sediment transport and resuspension in the Bay is driven by channel erosion and bedload resuspension. However, the CBP model does not handle these sediment dynamics components particularly well. Given this, we understand that the CBP model will need further refinement to more accurately predict sediment movement.

Q: Bill Stack – It must also be noted that the CBP watershed model does not model urban watersheds well. My concern is whether the adjustments that have been made to the Bay watershed model are sufficient to characterize the Baltimore Harbor watershed. Or do further adjustments need to be made to the Bay watershed model so that it comes more into line with the MDE model?

A: Miao-Li Chang – Currently we are unsure as to whether or not changes will be made to Phase 4.3. However, Phase 5 of the Bay watershed model will contain several changes that should reduce the difference between the models. However, based on the varying that each organization is following, MDE will continue to move forward without the results of the Phase 5 watershed model.

Q: Steve Stewart – Why did MDE chose May 1995 to begin modeling? Does May 1995 represent average conditions?

A: Miao-Li Chang – To develop a model for the Harbor toxic TMDLs, MDE worked with UMCES to design a monitoring plan in May 1995. Using this as a starting point, MDE conducted the CHARM project to fulfill the data requirements for more sophisticated models. The cruises for CHARM were conducted in 1999 and 2000. May 1995 represents an "average" or less dynamic month. The goal of the CHARM project was to collect data in different dynamic conditions (wet and dry months).

Q: Steve Stewart – Based on the earlier comment regarding sediment movements, can MDE partition loads between bedload sediments and other sources?

A: Rich Eskin – This is very difficult issue to assess, the hope is to further develop the understanding of sediment contributions to Harbor and Bay through work at CBP.

Q: Gould Charshee – Given that there is a legacy of industrial pollution in the Harbor that varies spatially, how did you come up with the data for the model that represents this spatial variability?

A: Miao-Li Chang – The modeling scenario runs will attempt to assess the impact of various sediments (e.g., nonpoint source, point source, and in situ) on water quality.

Q: Gould Charshee – Don't you need to make certain assumptions about the rate at which these compounds leave the sediment?

A: Miao-Li Chang – Yes, a sediment flux rate is used to describe the interactions with chemicals entering and leaving sediments.

Q: John Botts – How many scenario runs are you planning to do?

A: Miao-Li Chang – The goal will be to initially use scenario runs to understand what inputs are the most sensitive to change. Following that exercise, MDE will develop further scenarios to determine what actions will help us achieve water quality standards. Therefore, an exact number is not available.

Q: Kim Coble – Is the endpoint that MDE is using to determine the TMDLs the water column?

A: Miao-Li Chang – It could be either the water column or sediments, this depends on what is the cause of the impairment.

Q: Kim Coble – What about fish tissue concentrations?

A: Miao-Li Chang – The fish tissue information will be used with the Bioaccumulation Sediment Factor (BASF) to relate fish tissue concentration to sediment concentration

Q: Kim Coble – For what pollutants will scenarios be run for?

A: Miao-Li Chang – Scenarios will be run on the contaminants listed on the 1996 and 1998 version of the 303(d) list.

Q: Damian Preziosi – What is the timeline for the completion of this work?

A: Miao-Li Chang – The model scenario run draft reports should be completed somewhere around the end of June 2003 so they can be sent out for review.

Q: Damian Preziosi – Will there be an external review of the scenario runs?

A: Miao-Li Chang – Yes, the review process MDE utilizes includes internal review, interagency review, peer review, and public review. Additionally, we will have a technical review of the model prior to completing the modeling process and scenario runs.

Q: John Botts – How will the scenario runs affect the development of TMDLs? Are you considering one TMDL for the Harbor or several smaller ones?

A: Miao-Li Chang – The scenario runs will dictate the development of the TMDLs, and we will be completing several TMDLs for each impaired segment of the Harbor. For example, in Bear Creek we will be developing TMDLs for Zn, Cr, and PCB's individually.

Q: Steve Dyer – Are Gwynns Falls and Jones Falls considered external sources to the Harbor?

A: Miao-Li Chang – Yes

Toxics Endpoints (Joe Beaman)

- Introduction to Toxic Impairments in Sediment and Water Quality
- Contaminated Sediment Evaluation Tools
- Baltimore Harbor Data
- Toxic TMDLs Endpoints
- Discussion

Q Kim Coble – Was a sensitive population analysis conducted?

A: Joe Beaman – No, the Clean Water Act requires a general population analysis and not a sensitive population analysis.

Q: Rich Hersey – How/why were the fish species used in the analysis selected, are they good indicator species or was it data availability?

A: Joe Beaman – The species chosen (perch, bullhead, and catfish) are both good indicator species and MDE has collected data on these species. Both catfish and bullheads have a relatively small home range. Meanwhile, white perch are ubiquitous in the Bay and a higher predator species. Also, perch have the tendency to settle in one region if the feeding is good and accumulate the contaminants of a specific area.

Q: Cece Donovan – Given that there is a high level of background Zn in the region, is the ER-40 level set too low? Is it below some of the natural background concentrations found in the harbor?

A: Joe Beaman – No, the background level of Zn in the Harbor is below the ER-40 value.

Q: Greg Kapler – Are the TMDL endpoints going to be calculated for the whole harbor, all 80 stations, or is MDE going to concentrate on specific sections of the Harbor?

A: Joe Beaman – The endpoints are calculated by impaired segment by impairment. For example in the Northwest Branch/Inner Harbor there will be endpoints for Zn, Pb, Cr, and PCBs.

Q: Greg Kapler – In the Northwest Branch/Inner Harbor, it appears you only have two samples. Is this considered sufficient to characterize this body of water?

A: Joe Beaman – There are two toxicity stations and seven chemistry stations in that region of the Harbor and those data points provide enough information to characterize that particular region.

Q: Cece Donovan – Has MDE sampled for more parameters that what has been presented today?

A: Joe Beaman – Yes, we have evaluated the data and have used it to add to add a PCB impairment to the Middle Harbor. Otherwise, the data did not indicate further impairments.

Q: John Botts – What are the number of meals chosen for the analysis of PCBs and how was that chosen?

A: Joe Beaman – The number of meals was developed in the guidance documents generated last year. The wholesomeness of fish definition was interpreted by MDE to mean 4meals/month caught by a recreation fisherman in the same body of water.

Q: John Botts – So, no extra consideration was given to local fisherman?

A: Joe Beaman – No it was not, currently MDE is working with John Hopkins University to conduct a health study on licensed and non-licensed fisherman to assess exposure to local fishers who may have higher exposure rates.

Q: Damian Preziosi – What is the process used to identify and evaluate chemicals? What are the screening levels that were used to determine the cause of toxicity?

A: Joe Beaman – We have already done our characterization of the Harbor in developing the 1996 and 1998 303(d) list. During this process we used the ERM as a guidance number for impairments. If a sufficient number of stations within a given segment exceeded the ERM then a segment was listed as impaired. Once listed, a TMDL must be completed. So, for consistency we are still using the ERM as guidance, and additionally reducing that value by 10% to achieve the ER-40 that was presented. The additional 10% reduction serves as a measure of safety.

Q: Damian Preziosi – Are you taking into consideration the issue of confidence levels with the ERM/ER-40 values that are being developed for the metals?

A: Joe Beaman – We are looking at the metals and their relationship to toxicity independently of the TMDL process. For instance, we have observed areas of the Harbor with elevated Zn levels, yet toxicity is not observed at these sites.

Q: Damian Preziosi – How are you addressing bioavailability issues such as sediment sulfide content and organic carbon content?

A: Joe Beaman – We include correction factors for bioavailability issues and are also looking at recent research regarding these topics. The most recent research indicates that AVS/SEM may not be as dominant a factor in controlling metals bioavailability.

Q: John Botts – Was sulfur data collected with all the samples?

A: Joe Beaman – Yes, on several occasions stations were resampled and sulfur data was collected to correlate toxicity data with bioavailability.

Q: Damian Preziosi – Is there public access to the data?

A: Joe Beaman – Not at the current moment but it could be made available.

Q: John Botts– Are there going to be other margins of safety incorporated into the TMDL?

A: Joe Beaman – There may be additional margins of safety included to account for future growth.

Q: Steve Dyer – These data are all sediment data, correct? The issue is how sediment contaminants go back into the water column, or is it just a sediment issue? Are the TMDLs going to be developed based on the sediments?

A: Joe Beaman – Yes the data is sediment data. The issue is both sediment and water column. Finally, the TMDLs will address sediments, which in turn, affect the water column through the process of resuspension.

Q: Steve Stewart – Are these toxicity test strictly sediment tests or are there water column toxicity tests?

A: Miao-Li Chang – The toxicity tests are sediment tests.

Q: John Botts – The BSAF (Biota Sediment Accumulation Factor) calculation; how are you going to include that in the TMDL? Given that you are going to try to relate a number generated through these equations to a level of contamination that may or may not be achievable in the sediments? Is the baseline level going to be practical?

A: Joe Beaman – MDE will go through the complete BSAF calculation for the TMDL development process. It will depend on the level of contamination, at high levels of contamination we have to do something to address the issue. The baselines are a goal and the expectation is that with PCBs being a banned substance, the agency can move forward to achieving this goal. Hopefully, since PCBs are a banned substance, we will not see any large levels of inputs into the system

Q: John Botts – What about atmospheric sources of PCBs?

A: Joe Beaman – Sure the atmosphere is a source of PCBs. However, MDE has data from a couple atmospheric stations on the Eastern Shore that indicate that concentrations are fairly low. Also, the higher molecular weight PCB congeners do not travel well through the atmosphere.

Q: John Botts – That is why in urban areas, you will have differences from what is observed on the Eastern Shore.

A: Joe Beaman – Yes, there is a difference. Yet, if you reduce stormwater inputs through the use of BMPs and clean sediments enter the system, then you should see burial of PCB containing sediments below the biologically active layer. Although dredging the harbor and capping the harbor are not practical we still need to set a goal to achieve in the Harbor.

Q: John Botts – What I am saying is that you may find you need to use a translator coefficient.

A: Joe Beaman – MDE has not considered that to date, but I may need to discuss that with you later.

Q: Damien Presiozi – What would be your position regarding sediment endpoints?

A: Rich Eskin – At the time when a decision is required, we will talk with the Secretary to determine the policy to be followed. I do not want to project out this early and preempt the Secretary's decision on the topic.

S: Damien Presiozi – Every time you create a number like this, it does take a life of its own.

A: Rich Eskin – There are several potential responses that we have and we do not want to limit those. We also have to look at the economic impacts of the decisions, so we will have to wait and see what the numbers tell us. Perhaps we may have to do additional studies to more precisely define the problem.

Q: Cece Donovan – So, from what I heard, some of the endpoints may be water quality based, and the TMDL is trying to figure out the relationship with sediments.

A: Joe Beaman – Yes, there are several potential options; monitored natural recovery, capping, and dredging.

S: Cece Donovan – Yes, but since it (PCBs) is a legacy issue and banned there is a limited amount you can do in a water quality based TMDL

A: Joe Beaman – Absolutely. However, if we do see something through the monitoring data that the sources of PCBs are not legacy issues – stormwater inputs for example – we will have to do something to address the issue. We may not be able to do as much for the legacy issues other than natural recovery or remediation, however, we would have to do something about the watershed sources contributing to the harbor.

S: John Botts – In New York and New Jersey Harbor the authorities are going through the same thing you are - trying to set TMDLs for PCBs. However, they realize that getting from enforceable water quality criteria to a sediment endpoint is extremely difficult. Using hindsight they have chosen to use a transmitter value to help relate concentrations ? *Unable to transcribe from tape.*

Q: Mike Powell – Is there any indication in the data of a downward trend either in the sediment concentration or fish tissue values that corresponds with the decrease in point source loadings?

A: Joe Beaman – I can't speak specifically for the Harbor, however, I can discuss what has occurred in the Back River where we also have a Chlordane advisory. In the Back River we have seen reductions in the concentrations such that the Chlordane fish tissue advisory has been removed. Similarly, I am also thinking that we will also see a similar reduction of Chlordane levels in the Harbor.

Q: Mike Powell – So, given the relationship observed with Chlordane, and presence of other legacy pollutants, is it possible, using the model, to project out to when you could expect the levels of contaminants to fall below levels we are concerned about

A: Rich Eskin – That would be very difficult. It would depend upon whether an area is either erosional or depositional. Furthermore, the variability of sediment concentrations makes it difficult to predict. To better understand sediment behavior in the Harbor undisturbed cores would help, however those are generally not found because of the rate of use in the Harbor. In addition, long term benthic monitoring in the mid 1990's indicated changes in benthic community in a positive direction, but slow.

S: Rich Hersey – I wanted to note that you could not make that same generalization about the Back River because is not dredged like Harbor.

A: Joe Beaman – I would agree. However, in some of the smaller tributaries of the Harbor, where dredging does not occur, the results may be similar. Additionally, I wanted let you know that at a meeting I attended several weeks ago, I heard a presentation regarding PCBs in the Hudson River. In the study, the researchers were modeling fish tissue recovery. In one circumstance, they shut off all PCB sources and it took 20yrs to decrease from 5-6ppm to 1ppm, which is ½ the EPA action level and 3 times our <1 meal per month restriction.

Q: John Kearns – The ER – 40 level is the concentration at which you would expect to see toxic effects 40% of the time, is this correct?

A: Joe Beaman – Yes, that is correct. However we have not done a specific analysis to correlate the ERM (50^{th} percentile) – 10% to the 40^{th} percentile of toxic effects. The ER-40 is simply the ERM – 10%. It does not directly correlate to the concentration where 40% of the time you would expect toxic effects.

Q: John Kearns – So would it be fair to say that you are setting this criterion level at something that has a high level of potential toxicity?

A: Rich Eskin – Yes and no. The studies that were used to develop the ERM were often based on mixtures of chemicals with toxic properties. So to look at an ERM level specifically for lead may provide a number that could be the result of lead and several other factors. Also, the ERM calculation does not take into effect mitigating circumstances that sequester the toxic chemicals such as organic carbon or sulfides.

S: John Kearns – So we could have a situation in Baltimore Harbor where the sediments only have lead and zinc in it, or should we expect to observe a cumulative effect here?

A: Rich Eskin – We expect to see a cumulative effect in the Harbor. Also, we have empirical data that indicates that we have zinc and nickel in the Harbor and no toxicity associated with the levels above the ERM – most likely due to the mitigating circumstances.

Joe Beaman – In many areas of the Harbor we have zinc exceeding the ERM and no toxicity, and in several circumstances we have zinc and nickel together above the ERM and no toxicity.

Q: John Kearns – Has any attempt been made mathematically to factor in the high background levels of zinc into the calculations?

A: Joe Beaman – Yes, we are looking at anthropogenic enrichment.

Q: John Kearns – So, in the calculation you are trying look at the origin of the material?

A: Joe Beaman – Yes, *but we have not completed the work in the yet.*

S: James Hill – In the Baltimore Harbor sediments, take nickel for instance –there is a certain background concentration. When Harbor sediment concentrations are normalized based on particle size and compared to main stem Chesapeake Bay sediment concentrations you can determine the level of anthropogenic enrichment.

Q John Kearns - Earlier in your presentation, you talk about the biologically active layer of the sediment, what is the depth of that layer?

A: Joe Beaman – The depth is approximately the first 6 inches below the sediment water interface.

Q: John Kearns – What was the technique used to collect the surface sediments?

A: Joe Beaman – A ponar or box ponar sampling device was used.

Q: John Kearns – So the surface samples of sediments do not necessarily represent the sequestered values of PCBs that would be of concern if they were reintroduced to the surface?

A: Joe Beaman – Yes, the values may be higher or lower but the reported values represent what are on the concentrations found on the surface layer.

S: John Kearns – What is immediately available, what it does not take into effect are the sediments further down that contain the legacy contaminants.

Q: John Kearns – Concerning the chemical and fish tissue analysis that were performed, could you tell us who performed those analyses?

A: Joe Beaman – Yes, Joel Baker at the University of Maryland Chesapeake Biological Lab

Q: John Kearns – Can you tell anything about the analytical methodology?

A: Joe Beaman – The analytical methods are from CBL, I can send them to you if you would like.

Q: John Botts – When you get to calculate the TMDL sediment thresholds – is that going to be a one shot process or it going to be open to discussions once draft numbers are available? What is the time frame for conducting the analysis?

A: Joe Beaman – I can't give you specific dates. Right now we are waiting on fish tissue data, once that data is available we will move quickly. I am expecting the data to be available in late October.

Scott Macomber – Based on the amount work to be conducted in the next few months we may need to conduct an extra meeting to cover the various topics that are being discussed.

Point Source Decision Criteria (Scott Macomber)

- Data Sources
- Model Constraints
- Decision Criteria
- Calculations and Evaluations

Q: Steve Dyer – The table presented today is not the same as the one sent to me a couple weeks ago describing loads. What is the difference?

A: Scott Macomber – Yes, the numbers presented today are different. The new table includes the calculation of loads based on average flows multiplied by average concentrations. This change has been made based on comments that you and others provided during the initial review process. The new data will be sent out soon after this meeting for further review.

Q: Cece Donovan – Is there a state database that can be used to collect data for analysis of point source loadings in the Harbor? Although we don't have one currently, we will in the future and I am interested in understanding how MDE will address this issue.

A: Scott Macomber – I will check and see if a state database exists that captures discharge information. Regarding the future point source, the agency has not determined a policy on how to address the request for an allocation for a future point source. That is not my decision and I am unsure of the legal aspects surrounding that situation.

Q: Barbara Bachman – An underlying assumption in using the PCS database is that it is limited in a permit that it is significant in a discharge and if a particular parameter for instance is not required to be monitored at an outfall then it is not worth worrying about. Have you given that any thought?

A: Scott Macomber – I have not pondered it for hours. However, to the extent that if a parameter is not in a discharge and/or nobody has been monitoring for it, then MDE will have a difficult time generating a load value. Based on the assumption that our colleagues in the Water Management Administration, who develop the discharge permits have looked at the permit applications and assessed the constituents contained in the discharge, I would suggest that if it was considered significant then it would be part of the permit.

Q: Barbara Bachman – A follow up question: If the data that you have collected will be used to help with the modeling, how will data generated after the calibration period be used? Will it be used to estimate loads into the Harbor?

A: Scott Macomber – To the extent that the nutrient model is calibrated from 1992-1997 and the toxics model is calibrated from 1996 – 98/99, the data collected will be used for the calibration of the model. The data obtained from permit holders after the calibration period will be used to simulate current conditions and help with the development of future condition scenario runs.

S: Barbara Bachman – Maybe I'm jumping the gun here, but I am assuming that all this work will lead to allocations. If that is the case then I am concerned there might be an underestimation of point sources – that is, if permits were written in 99/00 will you be able to pick up that data?

A: Scott Macomber – Yes, this will lead to allocations. And yes, we have reviewed new and revised permit data.

Q: Barbara Bachman – I understand that the PCS data that you have collected so far is going up to the year 2000, is that correct?

A: Scott Macomber – Yes, to the extent that the data collected has been used for the calibration. For instance, there are point sources in the Harbor that have had permits reissued for them recently. Based on the new permits these facilities are generating different loads. We will use the new data to better understand the changes in loads coming from the facility. When it comes time to develop current status and future scenarios the new loads based on the new permits will help us with our ability to represent current conditions.

Q: Damian Preziosi - Earlier you discussed that certain point sources were being excluded, I think it was a 0.5MGD flow as a cutoff for point sources in the Harbor. This does not exclude them from the allocation part of the TMDL, does it?

A: Scott Macomber – No, it does not. The exclusion was simply for the model. The model can only handle a certain number of parameters before it becomes too memory intensive, the restriction of sources was simply to help facilitate the modeling process. Point sources will still be subject to allocations whether or not they are included in the model.

Q: Name? Model calibration question; when you go about the model calibration what are the parameters that are adjusted?

A: Miao-Li Chang – It depends on model and the process simulated within the model. The nutrient and toxics models are different. For example, in the nutrients model you can adjust the carbon cycle among over 100 other variables. In the toxics water quality model you can adjust the sediment flux rate for example.

Action Item:

- Send out new load values and revised criteria

Back River TMDL Update (Miao-Li Chang)

- Impairments
- Data
- Modeling
- Schedule

Unfortunately due to a technical glitch the question and answer section regarding the Back River was not recorded and the conversation was lost.

The Back River is impaired for nutrients and PCBs.
The general discussion surrounding the Back River TMDL effort focused on the ability of MDE to estimate loads of PCBs into the River. Research will continue into techniques to improve MDE's ability to quantify PCB loads from the watershed.

Date for Next Meeting: December 3, 2002 – Location MDE offices at Montgomery Park